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VASCULAR DISEASE

RELATING CAROTID PLAQUE VOLUME REDUCTION ASSESSED BY 3T MRI WITH INFLAMMATORY CYTOKINE CHANGE FOLLOWING 6 MONTH STATIN TREATMENT

ACC Poster Contributions
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Background: The beneficial effects of statins in plaque regression/stabilization arise from both lipid lowering and systemic antiinflammatory effects. The relationship between change in inflammatory cytokines (IC) and in-vivo change in plaque burden is not well established. Our aim is to measure change in IC following 6 months of statin treatment in patients with carotid atherosclerosis and relate these to change in plaque volume (PV) and plaque component as measured by 3T MRI.

Methods: 19 subjects (14 males, 67±11 years) with carotid atherosclerosis had carotid MRI at baseline and following 6 months of statin treatment. Sera was drawn at both time points and analyzed for 18 inflammatory cytokines (Bioplex cytokine assay kit) and compared. Plaque volume and plaque component volume were measured using Plaqueview software from T1, T2, proton density and time of flight 3T MRI images (±12 mm from flow divider, 0.6x0.6x2mm spatial resolution) and correlated with change in cytokine levels.

Results: Carotid PV had significant correlation with hsCRP, interleukin (IL)-6 and IL-17 (R=0.43, 0.36 and 0.73, all $p<0.05$). Following 6 month statin treatment, PV decreased 7.8% (1123±72 vs. 1035±33 mm3, p=0.015) while volume of necrotic component changed from 188±26 to 173±32 mm3 (p=NS) . There was significant reduction in IL-1β (13.9±8 vs. 0.6±0.1 pg/mLp<0.001), IL-7 (10.6±3 vs. 6.9±0.7 pg/mL, p=0.03) and IL-9 (50±25 vs. 16±6 pg/mL, p=0.045). LDL changed from 92±8 to 78±6 mg/dL while hsCRP changed from 2.6±0.7 to 1.8±0.4 mg/L (both p=NS). Among cytokines, only reduction of IL-7 was associated with reduction in plaque necrotic volume (R=0.47, p=0.04; R=0.44, p=0.05 vs. change in PV).

Conclusions: In patients with carotid atherosclerosis, 6 month statin treatment is associated with plaque volume reduction as measured by 3T MRI, as well as reduction in IL-1β, IL-7 and IL-9. Among 18 cytokines tested only IL-7, a cytokine previously associated with clinical plaque vulnerability, correlated with change in carotid plaque necrotic volume. This initial result may lead to studies to determine the clinical utility of this systemic marker in serial assessment of plaque vulnerability and response to treatment.